

Applicant: Hannu Pullinen et al.
PCT App. No.:

Claim Listing

7. (new) A multiple-nip calender comprising:
a set of rolls having an upper roll, a lower roll, and a plurality of rolls arranged between the upper roll and the lower roll, each of the plurality of rolls defining a first nip and a second nip with other rolls of the set of rolls, the first nip being on the opposite side of the roll from the second nip;
a fiber web passing through the nips;
a first guide roll;
a second guide roll spaced from the first guide roll;
a pocket formed by the fiber web extending from the first nip of one of the plurality of rolls, to the first guide roll, to the second guide roll, to the second nip of said one of the plurality of rolls, the pocket defining a portion of the web extending from the first guide roll to the second guide roll; and
a damping unit disposed in the pocket and arranged to spray water on the portion of the web extending from the first guide roll to the second guide roll, the first guide roll and the second guide roll arranged to guide the fiber web relative to the damping unit.
8. (new) The multiple-nip calender of claim 7, wherein the set of rolls comprises a plurality of nips formed between polymer rolls and steel rolls, the calender having a reversing nip between two polymer rolls, and wherein said first nip of said one of said plurality of rolls is located immediately before the reversing nip and the second nip is the reversing nip.
9. (new) The multiple-nip calender of claim 7, wherein the upper roll, the lower roll, and the plurality of rolls define a plane passing through the nips formed between the rolls of the set of rolls, and wherein the plane is vertical or at an angle to a horizontal plane.

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10. (new) The multiple-nip calender of claim 7, further comprising a frame to which the damping unit and the first guide roll and the second guide roll are attached.

11. (new) The multiple-nip calender of claim 7, wherein the damping unit has a frontal face from which water is arranged to be sprayed, the first guide roll and the second guide roll being located on either side of a frontal face of the damping unit, the frontal face being in spaced parallel relation to the portion of the web extending from first guide roll to the second guide roll.

12. (new) The multiple-nip calender of claim 7, wherein the first guide roll consists of a plurality of successive roll sections.

13. (new) A multiple-nip calender comprising:
a set of rolls having an upper roll, a lower roll, and a plurality of rolls between the upper roll and the lower roll, each of the plurality of rolls defining a first nip and a second nip on opposite sides of the roll, the first and second nips formed with adjacent rolls of said set of rolls;
a fiber web passing through the nips;
a pocket formed by the fiber web extending from the first nip of one of the plurality of rolls, to the second nip of said one of the plurality of rolls;
a roll means for damping a portion of the web extending from a first guide roll to a second guide roll of the roll means, the roll means disposed in the pocket and having a damping unit arranged to spray water on the portion of the web extending from the first guide roll to the second guide roll of the roll means, the first guide roll and the second guide roll arranged to guide the fiber web relative to the damping unit.

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14. (new) The multiple-nip calender of claim 13, wherein the set of rolls comprises a plurality of nips formed between polymer rolls and steel rolls, the calender having a reversing nip between two polymer rolls, and wherein said first nip of said one of the plurality of rolls is located immediately before the reversing nip and the second nip of said one of the plurality of rolls is the reversing nip.

15. (new) The multiple-nip calender of claim 13, wherein the set of rolls define a plane passing through the nips formed between the upper roll, the lower roll and the plurality of rolls, and wherein the plane is vertical or at an angle to a horizontal plane.

16. (new) The multiple-nip calender of claim 13, wherein the roll means has a frame, to which the damping unit and the first guide roll and the second guide roll are attached.

17. (new) The multiple-nip calender of claim 13, wherein the damping unit has a frontal face from which water is arranged to be sprayed, the first guide roll and the second guide roll being located on either side of the frontal face, the frontal face being in spaced parallel relation to the portion of the web extending from the first guide roll to the second guide roll.

18. (new) The multiple-nip calender of claim 13, wherein the first guide roll consists of a plurality of successive roll sections.

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19. (new) A moistening arrangement replacement for an output roll of a multiple-nip calender comprising:

- a frame;
- a first roll mounted to the frame;
- a second roll mounted to the frame in spaced parallel relation to the first roll, and defining a damping space therebetween; and
- a damping unit mounted to the frame, the damping unit having a frontal face defining a surface through which water is sprayed, so that when a fiber web is passed from the multiple-nip calender to the first roll and from the first roll to the second roll and back to the multiple-nip calender, the fiber web passes over the frontal face and is moistened between the first roll and the second roll, the moistening arrangement serving to replace the output roll of a multiple nip calender.

20. (new) The apparatus of claim 19, wherein the first guide roll consists of a plurality of successive roll sections.